DMS-8200, Traffic Paint

Overview

Effective Date: November 2000 – July 2004.

This specification shall govern the materials, composition, manufacture, and testing of coatings and related materials.

Bidders' and/or Vendors Requirements

All prospective bidders and/or vendors are notified that, before any bid is considered, the Texas Department of Transportation (TxDOT) and/or the Texas Building and Procurement Commission (TBPC) may require them to submit a detailed statement concerning their previous experience in performing similar or comparable work; business and technical organization; financial resources; and manufacturing facilities, which are to be used in performing the work described in the contract.

Any bid submitted by a bidder and/or vendor that has unsatisfactory facilities, resources, or experience may be rejected by TxDOT or TBPC.

Payment

Procurement by the State

Payment for all materials under this specification shall be according to the conditions prescribed in the purchase order awarded by TxDOT or the TBPC.

Contracts

All materials covered by this specification, utilized in the performance of work shown on the plans, shall be considered subsidiary to the bid item or paid for according to the bid item in the contract.

Sampling, Testing, and Inspection

Sampling and Testing

Sampling of raw materials and finished paint shall be done by using Test Method "Tex-801-B, Testing Coatings and Related Materials."

Testing shall be according to CST/M&P's *Manual of Testing Procedures*. CST/M&P will perform any or all tests required to establish or verify performance. In case of variance, TxDOT's tests will govern.

Any questions shall be addressed to the Texas Department of Transportation, Construction Division, Director of the Materials & Pavements Section (CP51), 125 East 11th Street, Austin, TX 78701-2483.

Materials required to meet this specification and purchased either by TxDOT or by the contractors for use on projects under TxDOT's jurisdiction are required to be inspected and tested.

Specifications, codes, acceptable practices, etc., not specifically listed in these specifications are not applicable.

Agency

Tests on finished products and raw materials, as well as inspection during manufacture, will be made by TxDOT or by a commercial laboratory designated by TxDOT.

Costs

Costs of sampling and testing are normally borne by TxDOT; however, the costs of sampling and testing of materials failing to conform to the requirements of this specification shall be borne by the bidder or vendor.

The cost of sampling and testing failing material shall be at the rate established by the Director of CST/M&P, which is in effect at the time the material is tested.

Amounts due TxDOT for conducting such tests will be deducted from partial or final payments on direct purchases by the State.

The bidder or vendor may be required to reimburse TxDOT for the cost of storage and/or handling of materials failing to meet specification requirements.

For materials purchased on the open market by contractors, all costs of inspection and testing (whether performed directly by TxDOT or by commercial laboratories designated by TxDOT) will be charged to the Contractor. These costs will be deducted from the amounts due the Contractor on monthly and final estimates.

Sequence of Inspection

The vendor shall provide the Texas Department of Transportation, Construction Division, Director of the Materials & Pavements Section (CP51), 125 E. 11th Street, Austin, TX 78701-2483 with the brand names and characteristics of all raw materials, which the vendor proposes to use.

The vendor shall also arrange inspection of production.

Samples of raw materials used in production and samples of the finished product will be taken during production by the TxDOT inspector.

The manufacturer shall provide standard friction-seal 0.47-liter (pint) cans for the sampling of raw materials and the finished product. If the raw materials or the finished paint is waterborne, the sample cans shall be lined to prevent rusting.

Manufacture shall be witnessed in whole or part at the discretion of the testing agency.

NOTE*:* Production shall not begin before the arrival of the TxDOT's authorized inspector, unless specific prior approval for starting has been obtained.

The manufacturer shall accord the inspector free access to those parts of the manufacturing facility wherein the products are being manufactured or raw materials are being stored, and in all other ways shall facilitate the inspector in performing his duties.

When raw materials and finished products are stored, they shall be in an orderly fashion to always permit proper and correct inventory of these materials.

Basis for Rejection

Raw materials and finished products, which fail to meet any requirement of this specification, may be subject to rejection. Final acceptance or rejection will be based on:

- the results of tests on samples of raw materials and finished products taken during production, or
- tests performed on finished products when practical after their arrival at the shipping destination.

Approval of materials as a result of preliminary testing before manufacture into finished products shall not be binding upon final approval or rejection.

Because of the possibility of contamination and volatile losses, it shall be agreed that only the Wet Standard prepared by TxDOT shall constitute the Standard for final comparison involving acceptance or rejection. Samples of these standards are available to the manufacturer.

The judgment of the Director of CST/M&P will be final in all questions concerning conformance with the provisions of this specification.

Conformance of Finished Products

Finished products shall conform on a weight basis to the composition requirements of the 'Standard Formulae' section. No variation from the Standard Formulae will be permitted, except for the replacement of volatiles lost in processing, unless approved by the Director of CST/M&P.

The finished products shall conform to all requirements that are stipulated for each Standard Formulae such as color, drying, flow, settling, brushability, can stability, hiding, etc.; and film characteristics such as gloss, hardness, light permanence, adhesion, etc.

Conformance of materials shall be tested under parallel conditions with a Wet Standard made by CST/M&P using the raw materials listed in the 'Standard Formulae.'

Manufacturing Procedures

The manufacturing procedures, except when specified, shall be left to the discretion of the manufacturer.

It is the responsibility of the manufacturer to ascertain that the proposed materials and manufacturing procedures will produce a product meeting the specification requirements.

Finished Products

When canned, the finished product shall be free from skins and foreign materials.

Containers shall be filled by weight based on the actual density (gallon weight) of the product at 25 °C (77 °F).

NOTE*:* Consistency, drying, and density (gallon weight) determinations on coatings are made at 25 °C (77 °F). Consistency is measured with a Krebs Modified Stormer Viscometer.

Containers and Markings

Containers

Shipment shall be made in suitable, strong, well-sealed containers that meet specification and federal requirements and are sufficiently sturdy to withstand normal shipping and handling.

- Drum Package Requirements:
  - To be in new, serviceable, nonleaking, 209-liter (55-gallon) lined, steel drums meeting all federal regulations (Attention is called to docket HM-181.)
  - Drums are to be nonreturnable with full removable heads, three (3) rolling hoops, 12 gauge locking rings with 15.9-millimeter (5/8-inch) locking bolt nut
  - Nominal metal thickness is to be 1.1 millimeter (0.044 inch)

- Drum bottom to be embossed with UN1A2/Y1.2/150 so drum can be recycled
- Each drum is to be equipped with a natural sponge-rubber cord, high-density gasket
- Rubber shall be approximately 10.9 millimeters (0.4375 inch) thick
- Gasket, when compressed, shall produce an airtight closure when drum is sealed
- When locking nut is used on drum rings, locking nut shall be in a nonlocking position while tightening the ring
- After ring is tight, locking nut shall be secured in locking position
- Seal shall be affixed to each drum in such a manner that drum contents cannot be adulterated without destroying seal

♦ Bucket Packaging Requirements:

- Paint is to be furnished in new 19-liter (five [5] gallon) lined, 24 gauge steel, nonleaking buckets.

Markings

Finished product containers and cases shall be plainly and securely labeled with:

♦ TxDOT

♦ Name and designation of the product

♦ Requisition number

♦ Batch number

♦ Manufacturing date (month and year)

♦ Gross weight

♦ Manufacturer's name

♦ "For Industrial Use Only" or "For Professional Use Only," and

♦ "Volatile Organic Compounds (VOC) 95 Grams Per Liter."

Labeling shall be on the sides of containers and cases, and must be sufficiently moisture resistant to withstand outdoor storage for a minimum of one year.

When the finished product is palletized for shipment, the labels shall be to the outside for easy identification.

Once the finished product has been labeled properly, the label shall not be modified or changed in any manner without specific approval of the Director of CST/M&P.

NOTE*:* The material manufacturer shall supply a Material Safety Data Sheet to comply with OSHA's Hazard Communication Standard 29 CFR *§* 1910.1200.

Raw Materials

Substitutions

The exact brands and types of raw materials used in the Wet Standard are listed to facilitate the selection of parallel materials.

These must be equal not only in quality and in composition but also in physical and chemical behavior after aging in the finished product.

Since evaluation of the finished product containing questionable materials may require 60 days and since meeting the delivery schedule is the responsibility of the manufacturer, the manufacturer is reminded to schedule material procurement and production to permit delivery commitments.

The final decision as to the equality of materials shall be made by the Director of CST/M&P.

After TxDOT has agreed to the brand names and types of raw materials proposed by the manufacturer, no substitution will be allowed during the manufacture without prior agreement with TxDOT.

NOTE*:* The manufacturer should be aware that it is the responsibility of the manufacturer to select raw materials, which not only meet the individual raw material specification but shall also produce a finished product meeting the specific formula requirements.

Materials of Foreign Origin

Because of the limited information available on materials manufactured outside the continental limits of the United States, the manufacturer is advised to review 'Substitutions' under 'Raw Materials' when considering the use of materials of foreign origin.

Specifications

All materials, which are required to meet TxDOT, federal, and/or ASTM specifications, must meet the latest specification in effect on the date of the proposal or invitation to bid.

Pigments

- Titanium Dioxide
  - ASTM D 476, Type II
- Yellow Pigment
  - The pigment in the following table is specified for use in the yellow traffic paint formula.

Yellow Pigment CI 65 (Reddish Yellow)	
Specific Gravity	1.40 to 1.76
Oil Absorption	20 to 30%
Moisture	0.5% maximum
Pigment Retained on #325 Sieve	0.1% maximum
C.I. Number	11740
Heat Stability	130 °C (266 °F) minimum

- Along with the above requirements, the infrared spectrum shall match the standard spectrum on file with CST/M&P.

♦ Calcium Carbonate

- ASTM D 1199, Type GC, Grade I, with minimum 95% $CaCO_3$ and Type PC, minimum 98% $CaCO_3$.

Acrylic Traffic Resin

This resin shall be similar and equal to the standard sample submitted to TxDOT by the manufacturer.

TxDOT must approve the resin before the contract award for coatings of the materials' proposed use.

The following table shall describe the predominantly acrylic emulsion to be used in manufacturing the traffic paint according to the 'Standard Formulae.'

Acrylic Traffic Emulsion	
Solids Content, %	48.5 - 51.5
Viscosity, #2 Spindle, 60 RPM, 25 °C, cps	250 maximum
pH	10.0 - 10.6
Film appearance, 75 micrometers (3 mil) dry	Smooth, clear, continuous

Along with the above requirements, the infrared spectrum shall match the standard spectrum on file with CST/M&P.

Miscellaneous Materials

Materials listed below must be similar and equal to the standard sample submitted by the vendor.

TxDOT must approve these materials before contract award for the coatings in which the material is proposed for use.

♦ Dispersant

- ST 136
- Tamol 850
- Colloids 226/35

- Surfactant
  - Triton X-405
  - Triton CF-10
  - Colloids CA-407
- Defoamer
  - Foamaster 111
  - Drew 493
  - Colloids 654
- Hydroxy Ethyl Cellulose
  - Natrosol 250 HBR
  - Bermocoll E43 1FQ
  - Cellosize QP-30,000
- Coalescent
  - Texanol
  - Exxate 1200
- Preservative
  - Nonformaldehyde-type designed for use in acrylic latex paint with pH above 10.0
  - Dowicil 75
  - Nuosept 101
- Methyl Alcohol
  - ASTM D 1152, with Refractive Index 1.3320 maximum.

Standard Formulae

The following tables contain the Standard Formulae to be followed by the manufacturer when manufacturing traffic paint to be supplied to the State or for contractors to use on state striping contracts.

Traffic Paint

- White

WPT-12, Lead Free		
Type	**Kilograms**	**(Pounds)**
Acrylic Emulsion, 49% Solids, Fastrack HD-21	243.2	(535.)
Coalescent, Texanol	11.4	(25.)
Titanium Dioxide, Rutile, Type II, Tiona RCL-9	45.4	(100.)
Calcium Carbonate, Type PC, Mississippi M-60	68.0	(150.)

Calcium Carbonate, Type GC, Hubercarb M-4	195.4	(430.)
Hydroxy Ethyl Cellulose, Natrosol 250 HBR	*0.2	*(0.5)
Defoamer, Foamaster 111	2.3	(5.)
Dispersant, Colloids 226/35	4.1	(9.)
Surfactant, Triton CF-10	0.9	(2.)
Methyl Alcohol	11.4	(25.)
Preservative	0.9	(2.)
Water, Potable**	8.1	(18.)
Total	591.3	(1301.5)

- Yellow

YPT-12, Lead Free		
Type	**Kilograms**	**(Pounds)**
Acrylic Emulsion, 49% Solids, Fastrack HD-21	243.2	(535.)
Coalescent, Texanol	11.4	(25.)
C.I. Pigment Yellow 65, Sunglow Yellow 1244	13.6	(30.)
Titanium Dioxide, Rutile, Special, Hitox	9.1	(20.)
Calcium Carbonate, Type GC, Hubercarb M-4	195.4	(430)
Calcium Carbonate, Type PC, Mississippi M-60	68.0	(150.)
Hydroxy Ethyl Cellulose, Natrosol 250 HBR	*0.2	*(0.5)
Defoamer, Foamaster 111	2.3	(5.)
Dispersant, Colloids 226/35	4.1	(9.)
Surfactant, Triton CF-10	0.9	(2.)
Methyl Alcohol	11.4	(25.)
Preservative	0.9	(2.)
Water, Potable**	8.1	(18.)
Total	568.6	(1251.5)

*The Hydroxy Ethyl Cellulose amount may be varied up to 0.9 kilograms (two [2] pounds).

**Use only 4.5 kilograms (ten [10] pounds) in the actual manufacture of the paint. The remaining 3.6 kilograms (eight [8] pounds) is used as a drum float.

Requirements

- Density (Gallon Weight)
  - ± 0.012/liter of theoretical density (± 0.10 pound of theoretical gallon weight [with water deleted])
- Grind
  - 4 minimum Particles: 8 maximum (Test Method "Tex-806-B, Determining Grind and Oversize Pigment Particles").
- Viscosity
  - 80 – 90 KU (with water deleted)

- pH
  - 9.6 minimum
- Skinning
  - None within 48 hours (Test Method "Tex-811-B, Skinning Characteristics of Coatings").

Filling Instructions

- The drums will be filled at 206.4 liters (54.5 gallons) by weight with a water float of 2.0 liters (0.53 gallon).

  The buckets will be filled at 18.75 liters (4.95 gallons) by weight with a water float of 0.18 liters (0.05 gallon).

  The pH of the float water shall be between 10.0 and 10.5.